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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/550,669

09/26/2005

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3025

52044

7590

01/21/2009

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EXAMINER

AGHDAM, FRESHTEH N

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,669	Applicant(s) OMOTO ET AL.	
	Examiner FRESHTEH N. AGHDAM	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6-11 and 22 is/are rejected.
- 7) ☒ Claim(s) 3-5, 12-14, and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-14 and 22-23 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 6-11, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubouchi et al (US 2002/0159413), and further in view of Han (US 2004/0125873).

As to claims 1, 7-10, and 22, Tsubouchi teaches a frequency synchronization apparatus that estimates a frequency error between an input signal from an external source and a reference signal, based on a correlation therebetween (fig. 20-21), and corrects the input signal so as to cancel out the frequency error (means 76 and 78), the input signal including a synchronization symbol that is composed of a synchronization waveform that exhibits a predetermined autocorrelation property (e.g. barker code see Persson et al US 2002/0118775, par. 2 under conclusion) that is included at least twice in the synchronization symbol (fig. 3), the frequency synchronization comprising: finding correlation vectors between the input signal and the reference signal (fig. 21, means

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76); generating, based on chronological transition in magnitude of the obtained correlation vectors, a synchronization waveform timing signal that indicates a predetermined timing in each cycle of the synchronization waveform (par. 183); finding a frequency error between the input signal and the reference signal based on an phase difference between each pair of chronologically neighboring correlation vectors according to the predetermined timing indicated by the synchronization waveform timing signal (par. 183); finding an absolute phase error between the input signal and the reference signal based on chronological transition of absolute phase of correlation vectors found with the timing indicated by the synchronization waveform timing signal (means 77, par. 184); and correcting the input signal by simultaneously giving the input signal a frequency shift and a phase rotation that cancel out the found frequency error and the found absolute phase error (means 78); and outputting the corrected input signal (means 78 and 39). Tsubouchi does not expressly teach evaluating average of phase difference to estimate the frequency error. However, one of ordinary skill in the art would recognize that it is well known in the art and/or obvious to obtain the average phase difference in order to estimate the frequency deviation as it is evidenced by Han (fig. 1, S3). Therefore, it would have been obvious to obtain the average phase difference in order to more accurately estimate the frequency error.

As to claims 2 and 11, one of ordinary skill in the art would recognize that it is obvious and/or a design choice to have a frequency error holding unit and an absolute phase error holding unit to hold the found frequency error and absolute phase error, and when a new frequency error and an absolute phase error is found then updating the

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held frequency error and absolute phase error if the newly found ones are different. Therefore, it would have been obvious to one of ordinary skill in the art to store the current found frequency error and absolute phase error in order to update/replace the previously found ones with the newly found ones.

As to claim 6, Tsubouchi teaches the input signal includes a data symbol in addition to the synchronization symbol (fig. 3), and a band of the synchronization symbol is limited so as to fall within an occupied frequency band of the data symbol (par. 66).

Allowable Subject Matter

Claims 3-5, 12-14, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Persson et al (US 2002/0118775) see par. 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRESHTEH N. AGHDAM whose telephone number is (571)272-6037. The examiner can normally be reached on 9:00-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Freshteh N Aghdam/

Examiner, Art Unit 2611

/Chieh M Fan/

Supervisory Patent Examiner, Art Unit 2611